76. (New) The method of claim 58, wherein the plastic material comprises polyethylene terephthalate and the solvent is a chlorinated hydrocarbon, and combinations of chlorinated hydrocarbons thereof.

77. (New) The method of claim 76, wherein the solvent is selected from the group consisting of chlorobenzene and chlorostyrene, and combinations thereof.

10 11 cont'd

78. (New) The method of claim 77, wherein the plasticizer is selected from the group consisting of dioctyl phthalate, dipropyl phthalate, and dimethyl phthalate.

79. (New) The method of claim 78, wherein the dye comprises a photochromic dye.

REMARKS

The Office Action mailed September 12, 2002 has been reviewed and carefully considered. The Examiner's reconsideration is respectfully requested in view of the above amendments and the following remarks. Claims 17, 18, 20-40 and 42-57 are pending in the present application. Claims 19 and 41 have been deleted. Claims 17-18, 24-26, 29, 32, 35, 39-40, 45-46, 48, 51 and 54 have been amended. New claims 58 – 79 have been added. No new matter has been introduced.

Claims 17-57 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,648,190 to Kato et al. (hereinafter Kato). Further, claims 17-57 were rejected under U.S. Patent No. 5,824,464 to Schell et al. (hereinafter Schell).

Applicants respectfully submit that Kato and/or Schell either alone or in any combination fail to disclose or suggest the subject matter of amended claims 17 and 39.

The Examiner has cited Kato for teaching a method for forming color on an image which may employ organic solvents, hydrocarbons, halogenated hydrocarbons and plasticizers which may be applied to a substrate, e.g. a plastic sheet. The Examiner states that Kato fails to teach a substrate that can be dyed in less than a minute or that the solvents are aggressive to the plastic material.

To improve the releasability between layers 12 and 2 (col. 19, lines 47-56), Kato treats the surface of layer 2 with resin grains synthesized via a non-aqueous dispersion polymerization method. (col. 21, lines 44-47). The polymerization method utilizes organic solvents (col. 21, lines 53-67). Light sensitive element 2, which may contain a plasticizer is formed on support 1, which may be a plastic sheet. A release agent (S) is adsorbed or adhered onto light sensitive element 2 (col. 28, 1-7).

Kato uses materials in a wholly different manner than the invention in that: Kato uses the organic solvent to synthesize a dispersion polymer rather than to dissolve a dye and plasticizer; Kato adsorbs a release agent onto a light sensitive (dye) layer containing a plasticizer rather than infusing a dye and plasticizer solution into a plastic article; and Kato maintains the organic solvent separate from the plastic sheet rather than contacting the plastic article with a dye-solvent solution.

Even if the above noted distinctions were ignored, Kato makes no mention of an aggressive solvent which has a solubility parameter within 1 unit of the plastic sheet it contacts, as recited in amended claims 17 and 39. Since the organic solvent of Kato does not contact the plastic sheet, there is clearly no suggestion or desirability of matching their solubility parameters.

The Office Action further cites Schell for teaching a support which may comprise polycarbonate, and wherein a coating composition containing an organic solvent and diallyl phthalate is coated onto the back of the support. Further, Schell discloses color photographic elements as typically containing dye, plasticizers, etc. coated onto the front of the support.

Schell utilizes materials differently than the invention in that: Schell combines dyes and plasticizers into a superposed image-forming emulsion layer, rather than dissolving a dye and plasticizer into a solvent; Schell provides a superposed coating of plasticizer in solvent rather than infusing a dye into a surface; and Schell maintains the dye separate from the solvent rather than contacting a plastic article with a dye-solvent solution.

Even if these critical differences were ignored, Schell employs less than 1% organic solvent having dispersed therein film-forming colloidal polymer particles, non-film-forming colloidal polymer particles (col. 4, lines 3-34) and additional components like inorganic fillers such as metal oxide particles, pigments, and magnetic particles (col.

4, lines 46-49). Since Schell forms a colloidal suspension that coats or superposes, there would be no motivation to specify an "aggressive" solvent. That is, a solvent having a solubility parameter within one unit of the plastic article, as recited in amended claims 17 and 39. The aggressiveness of the solvent is irrelevant in a coating, yet is critical for solutes being infused into optical articles, as claimed.

gel does not include or exclude

Accordingly, the subject matter of amended claims 17 and 39 is neither disclosed nor rendered obvious by the cited references Kato or Schell, either singly or in any combination. Thus, claims 17 and 39 are believed to be patentable and nonobvious over Kato and Schell for at least the reasons stated above. Claims 18 and 20-38 depend either directly or indirectly on claim 17 and thus include all the elements of claim 17. Claims 40 and 42-57 depend either directly or indirectly on claim 39 and thus include all the elements of claim 39. Thus, the dependent claims 18, 20-38 and 40, 42-57 are believed to be patentable for at least the reasons given for claims 17 and 39.

Accordingly, the Applicant respectfully requests withdrawal of all the rejections under 35 U.S.C. 103(a), and early allowance of all pending claims on the merits.

During careful review of the cited references, Applicant recognized that the key steps of dye infusion with aggressive solvent enabled penetration along with evaporation assisted by infused plasticizer to maintain optical transmission, were likely inventive. These steps are now respectfully presented in new independent claim 58, which borrows

language from the preamble of claim 17 (i.e. infusing) and from claim 24 (i.e. evaporating). The dependent claims 59 – 79 are identical to dependent claims 18 – 38.

CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that claims 17, 18 and 20-40 and 42-79 are patentable and nonobvious over the cited references. Consequently, the Applicants respectfully request reconsideration and withdrawal of the rejections and allowance of the application. Early and favorable consideration by the Examiner is respectfully urged.

A check for $378 is attached herewith to cover the amount due fo rthe 21 new dependent claims added. In the event that any other additional fees or charges are required at this time in connection with the application, they may be charged to applicant's representatives Deposit Account No. 50-1433.

Respectfully submitted,

By: Edwin H. Keusey

Edwin H. Keusey
Registration No. 34,361

Date: Feb. 12, 2003

The PTO did not receive the following listed item(s) check 378 Bill check #360 ...

Mailing Address:

KEUSEY, TUTUNJIAN & BITETTO, P.C.
14 Vanderventer Avenue, Suite 128
Port Washington, NY 11050
Tel.: (516) 883-3868
Fax: (516) 883-3869

MARKED UP VERSION OF AMENDED CLAIMS

17. (Twice Amended) A method of infusing a dye into a surface of [a] an optical plastic [material] article having a solubility parameter δ, comprising the steps of:

dissolving a dye and a plasticizer into an aggressive solvent having a solubility parameter δ within plus or minus 1 $(cal/cm^3)^{0.5}$ of the solubility parameter δ of the optical plastic article to form a solution; and

contacting the surface of the optical plastic article with the solution.

18. (Twice Amended) The method of claim 17, wherein the optical plastic [material] article comprises a plastic matrix and the dissolved plasticizer in the solution provides local surface mobility to the plastic matrix.

24. (Amended) The method of claim 17, further comprising the step of:

heating the optical plastic article to evaporate the solvent, following said contacting step.

25. (Amended) The method of claim 24, wherein the optical plastic article is heated to a temperature below the glass transition temperature of the optical plastic article.

26. (Amended) The method of claim 17, wherein the optical plastic [material] article comprises polycarbonate and the solvent is selected from the group consisting of tetrahydrofuran, a chlorinated hydrocarbon, and combinations thereof.

29. (Amended) The method of claim 17, wherein

the optical plastic [material] article is selected from the group consisting of polymethyl methacrylate and polycarbonate-polyester copolymers; and

the solvent is selected from the group consisting of tetrahydrofuran, a chlorinated hydrocarbon, and combinations thereof.

32. (Amended) The method of claim 17, wherein the optical plastic [material] article comprises polystyrene and the solvent is selected from the group consisting of tetrachloride, methyl isopropyl ketone, and propyl propionate, and combinations thereof.

35. (Amended) The method of claim 17, wherein the optical plastic [material] article comprises polyethylene terephthalate and the solvent is a chlorinated hydrocarbon, and combinations of chlorinated hydrocarbons thereof.

39. (Twice Amended) An article having a mixture infused therein by a solvent comprising:

[a] an optical plastic [material] article having a surface and a solubility parameter δ; and

a mixture of dye and a plasticizer infused into the surface, with said mixture having been infused while being dissolved in an aggressive solvent having a solubility parameter δ within plus or minus 1 $(cal/cm^3)^{0.5}$ of the solubility parameter δ of the optical plastic article.

40. (Twice Amended) The article of claim 39, wherein the optical plastic [material] article comprises a plastic matrix and the plasticizer provides local surface mobility to the plastic matrix.

45. (Amended) The article of claim 39, wherein the optical plastic [material] article comprises polycarbonate and the solvent is selected from the group consisting of tetrahydrofuran, a chlorinated hydrocarbon, and combinations thereof.

46. (Amended) The article of claim 45 [39], wherein the plasticizer is selected from the group consisting of polyethyleneglycol dibenzoate, pentaerythritol tetrabenzoate, dioctyl phthalate, dipropyl phthalate, dimethyl phthalate, dioctyl adipate and dioctyl sebacate.

48. (Amended) The article of claim 39, wherein

the optical plastic [material] article is selected from the group consisting of polymethyl methacrylate and polycarbonate-polyester copolymers; and

the solvent is selected from the group consisting of tetrahydrofuran, a chlorinated hydrocarbon, and combinations thereof.

51. (Amended) The article of claim 39, wherein the optical plastic [material] article comprises polystyrene and the solvent is selected from the group consisting of tetrachloride, methyl isopropyl ketone, and propyl propionate, and combinations thereof.

54. (Amended) The article of claim 39, wherein the optical plastic [material] article comprises polyethylene terephthalate and the solvent is a chlorinated hydrocarbon, and combinations of chlorinated hydrocarbons thereof.